

Evaluation of Freshwater Uses and Bacteria



What is our goal?

Meaningful and realistic
protection for recreational uses
of freshwaters



How do we do it?

❖ Water classifications

- Define desired uses to be protected (like swimming)

❖ Standards

- Benchmark numbers to protect uses

❖ Monitoring

- Compare data to standards



What uses do we protect?

❖ Survival & reproduction of aquatic life

❖ Recreational use

- Swimming
- Wading
- Fishing
- Boating



❖ Fish & shellfish consumption

❖ Drinking water supply

❖ Agricultural & industrial use

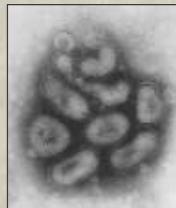


Why do we have standards?

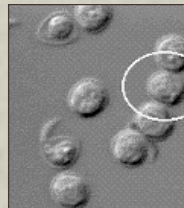
- ❖ Most cases of water-borne illnesses are caused by pathogens
- ❖ *Pathogens* are microorganisms that can cause illness under the right conditions



Bacteria



Viruses



Protozoa

Where do pathogens come from?

- ❖ There is always some natural level of pathogens in waters
- ❖ There are many potential sources and types of pathogenic bacteria



Why not monitor directly for Pathogens?

- ❖ Too many potential pathogens
- ❖ Testing methods for some not available
- ❖ May be present in very low numbers
- ❖ May not be present all the time
- ❖ Not always due to fecal wastes
- ❖ Long turnaround for results



What do we test for?

- ❖ Fecal coliform bacteria are an indicator that mimics the pathogens of concern
- ❖ When fecal coliform bacteria are present, it is possible that other organisms that can make us sick are present too



What are the sources of fecal contamination?

❖ Wildlife



❖ Agricultural waste:



- "direct deposit" from farm animals - lack of stream side fencing
- Improper manure application
- Poorly constructed/maintained waste storage

What are the sources of fecal contamination?

❖ Human activities:

-Human sewage:



- Leaky septic systems
- "straight pipes"
- Leaking sewer lines
- Poorly designed/maintained wastewater treatment plants

❖ Pet waste:



What makes a good Pathogen Indicator?

- ❖ Indicator predicts illness rates due to ingestion of water by swimmers
- ❖ Indicator is specific to sewage or fecal sources



Why are we considering changes now?

- ❖ Advancements in science & technology now allow for pathogen indicators more specific to fecal sources
- ❖ EPA is considering changes to national criteria by 2012
- ❖ EPA is requiring states to stop using fecal coliforms as an indicator and adopt a new indicator

What does EPA advise?

❖ *Enterococcus*

- Saltwater or freshwater
- Mimics the pathogens of concern
- However, may have non-fecal sources (plants and insects)



❖ *E. coli*

- Freshwater only
- More specific to sewage or fecal sources



Current EPA advice based on:

- ❖ Occurrence of gastroenteritis (illness)
- ❖ Data from two freshwater lakes
 - Lake Erie, Erie, PA
 - Keystone Lake, Tulsa, OK
- ❖ Summertime data only
- ❖ No flowing water data

What is our plan?

- ❖ Information gathering
- ❖ Collect data across the state from both lakes and streams to support any proposed changes
- ❖ Updates & reports to document the work & process
- ❖ Meaningful stakeholder involvement and public participation efforts statewide throughout this process
- ❖ Complete work by 2010 for consideration in next triennial review (to be final by 2011)

PLAN FIRST!

What are potential implications?

- ❖ Changes to our:
 - Ambient water quality monitoring
 - Water quality standards
 - Water classifications and uses
 - Permitting
 - Assessment & 303(d) listings



The intent is meaningful and realistic protection of recreational uses of freshwaters

- ❖ Identify the waterbodies of the state to apply swimming standards
- ❖ Provide the highest level of protection to these waters
- ❖ Focus limited resources on meeting standards in these waters
- ❖ Determine reasonable protection for waterbodies used less frequently for swimming

What is next?

- ❖ Collect **weekly** samples for fecal coliforms, *Enterococcus*, and *E. coli* statewide
- ❖ Sites will include streams and lakes in a range of sizes
- ❖ Research other state's programs



Here's where you come in

- ❖ Should all waters have the same recreational uses?
- ❖ Is it reasonable and realistic to protect all waters the same?
- ❖ Which indicator is best?
- ❖ Should there be seasonal, depth, size, or other considerations for standards?



How can you become involved?

- ❖ DHEC is seeking early and continued input and assistance in this effort.
- ❖ If you are interested in becoming involved, contact:

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Thank You
Questions?

